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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,093	08/20/2003	Edward A. Richley	MHK.029.013	4953
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LAWRENCE HARBIN MCINTYRE HARBIN & KING LLP 500 9TH STREET, S.E. WASHINGTON, DC 20003			EXAMINER PANWALKAR, VINEETA S	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 07/24/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/644,093

Applicant(s)

RICHLEY ET AL.

Examiner

Vineeta S. Panwalkar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 1-8, 26 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-11, 15, 16, 18, 19 and 21-24 is/are rejected.
- 7) ☒ Claim(s) 12-14, 17, 20 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 16 recites the limitation "said transistor" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 9-11 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Larrick, Jr. et al. (US 6026125), hereinafter, Larrick.
 - 2a. Regarding claim 9, Larrick shows an ultra wideband transmitter (Fig. 3) to transmit an ultra wideband signal, said transmitter comprising:
 - a switching device that produces a pulse in response to current flow through a conduction path thereof (Figs 3 and 4; Column 9, line 25 – column 11, line 2, wherein time gating circuit 120 with switches S1 and S2 is interpreted as claimed switching device);

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- a timing circuit to gate the switching device (Fig. 4, column 10, lines 25 – column 11, line 2; wherein delay line 180 and its taps are interpreted as claimed timing circuit);
 - a filter network (Fig. 3; Column 9, lines 25-35, wherein filter 110 and is interpreted as claimed filter network); and
 - the timing circuit to gate the switching device to release a pulse directly into the filter network and to pinch-off the conduction path after release of said pulse (Fig. 3, Column 9, lines 17-35; since the time gating circuit 120 controllably gates the oscillator output to provide a UWB signal, it is interpreted as claimed pinching off of the conduction path after release of pulse).
- 2b. Regarding claim 10, Larrick further shows the transmitter wherein said switching device comprises a field-effect transistor, and further includes a bias voltage applied to said transistor to effect production of said pulse (Column 10, lines 26 – 38. Bias voltage is inherently applied to field-effect transistors for operation of the transistors. Also see column 8, lines 4-15).
- 2c. Regarding claim 11, Larrick further shows the transmitter, wherein said filter network controls the transmitted ultra wideband signal in at least one of center-frequency, bandwidth, and impedance value of a load (Column 6, lines 6-46).

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2d. Regarding claim 18, Larrick shows an ultra wideband transmitter that produces a band-limited ultra wideband signal of a desired energy level, said transmitter comprising a pulse conditioning circuit having a predetermined spectral response, a source of power to apply a bias potential across an inductor of a filter network, and a timing circuit that controls a switching device to effect release of a pulse into the pulse conditioning circuit in a way to dissipate a majority of pulse energy of the pulse conditioning circuit into a load device (Fig 8 and Fig. 4; Column 7, line 50 – column 8, line 15 and column 10, line 25 – column 11, line 2, wherein time gating circuits 134 and 132 together are interpreted as claimed switching device (switches S1 and S2 in Fig. 4 show the details of a time gating circuit). Bias voltage source 150 is interpreted as claimed source of power and 163 is interpreted as claimed inductor, wherein filter of 130 and inductor 163 are interpreted as claimed filter network and filter network together with amplifier 160 are interpreted as claimed pulse conditioning network. Wideband antenna is interpreted as claimed load and due to impedance matching, the claimed dissipation of majority of pulse energy into load is inherent).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 15, 16, 19 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larrick in view.
- 3a. Regarding claim 15, Larrick shows an ultra wideband transmitter to supply a spectrally filtered UWB signal to a load device comprising:
 - a switching device having a gate to produce a UWB pulse (Figs 3 and 4; Column 9, line 25 – column 11, line 2, wherein time gating circuit 120 with switches S1 and S2 is interpreted as claimed switching device);

- a singly-terminated resonant circuit that provides a desired spectral response for said UWB pulse (Fig. 3; Column 9, lines 25-35, wherein filter 110 is interpreted as claimed resonant circuit);
- a timing circuit to drive the gate of the switching device to effect release of the pulse into said resonant circuit by immediately switching off a conduction path of the switching device after issuing the pulse (Fig. 4, column 10, lines 25 – column 11, line 2; wherein delay line 180 and its taps are interpreted as claimed timing circuit; Column 9, lines 17-35; since the time gating circuit 120 controllably gates the oscillator output to provide a UWB signal, it is interpreted as claimed pinching off of the conduction path after release of pulse); and
- a load device coupled to an output of said resonant circuit to dissipate energy directly into the load device, whereby to produce said spectrally filtered UWB signal across said load device (Column 9, lines 57-67, wherein antenna (Fig. 3) is interpreted as claimed load device because the spectrally filtered UWB is provided to the antenna and filter (claimed resonant circuit) inherently dissipates energy into the load (due to impedance matching)).

Thus, Larrick discloses all the limitations claimed, but fails to disclose the exact details of the filter.

In the same field of endeavor, Getgen discloses an electric resonant transfer filter wherein the resonant circuit includes a series inductor and a shunt capacitor

(Column 3, lines 12-28; Fig.1, filter 14 shown in Fig.2 by series inductor L1 and shunt capacitor C1).

Thus, it would have been obvious to a person of ordinary skill in the art to use the resonant circuit disclosed by Getgen as the resonant filter disclosed by Larrick because Getgen's filter design improves quality of the filter (Column 2, lines 5-20).

3b. Regarding claim 16, Larrick further discloses the transmitter, wherein said load device comprises an antenna and said switching device comprises a transistor (Column 10, lines 26 – 38). Also, a transistor inherently switches off at or near a zero crossings of current flowing through said transistor.¹

3c. Regarding claim 17, Larrick shows the ultra wideband transmitter of claim 18, wherein said switching device comprises a field-effect transistor (Column 10, lines 27-35).

Thus, Larrick discloses all the limitations claimed, but fails to explicitly disclose the exact details of operation of the FET.

However, it is well known that a field effect transistor displays non-linear characteristics when biased near pinch-off.²

¹ References showing that switching off of a transistor at zero crossings of current:

- Bishop et al. (US 3584289)
- Stich (US 3967173).

² References showing non-linear behavior of FET before pinch-off:

- Birkeland et al. (US 5325000)
- Dougherty et al. (US 5465420)

Thus, it would have been obvious to a person of ordinary skill in the art to operate the transistor in non-linear mode to pinch off the conduction path after release of the pulse in order to control the timing of the pulse accurately.

- 3d. Regarding claim 21, although Larrick does not explicitly mention so, it is well known in the art that when drain current of a transistor reaches or is near zero, it enters into pinch-off mode and switches off.³

Thus, it would have been obvious to a person of ordinary skill in the art to operate the transistor such that the drain current becomes zero so as to pinch off the conduction path in order to control the timing of the pulse accurately.

- 3e. Regarding claim 22, Larrick further shows ultra wideband transmitter wherein the load device comprises an antenna (Figs. 8 and 4).

- 3f. Regarding claim 23, Larrick shows an ultra wideband transmitter to supply a spectrally filtered UWB signal to a load device comprising:

- an antenna (Figs. 3, 4);
- a singly-terminated resonant circuit directly coupled to said antenna (Fig. 3; Column 9, lines 25-35, wherein filter 110 is interpreted as claimed resonant circuit);

³ References showing FET entering pinch-off mode when drain current approaches or becomes zero:

- Bennet (US 6288613 B1)
- Diddens (US 3758872)

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- a switching device applying potential voltage to resonant circuit (Figs 3 and 4; Column 9, line 25 – column 11, line 2, wherein time gating circuit 120 with switches S1 and S2 is interpreted as claimed switching device);
- a timing circuit to gate the switching device to open a conduction path thereof to supply a pulse directly to the resonant circuit, and to immediately pinch off the conduction path of the switching device after release of the pulse to the resonant circuit, whereby to dissipate greater than 50% of pulse energy of said resonant circuit into said antenna (Fig. 4, column 10, lines 25 – column 11, line 2; wherein delay line 180 and its taps are interpreted as claimed timing circuit; Column 9, lines 17-35; since the time gating circuit 120 controllably gates the oscillator output to provide a UWB signal, it is interpreted as claimed pinching off of the conduction path after release of pulse. Further, due to impedance matching, the claimed dissipation of more than 50% of pulse energy into antenna (or load) is inherent); and

Thus, Larrick discloses all the limitations claimed, but fails to disclose the exact details of the filter.

In the same field of endeavor, Getgen discloses an electric resonant transfer filter wherein the resonant circuit includes an inductor- capacitor network (Column 3, lines 12-28 and fig.1, filter 14 (also shown in Fig.2)).

Thus, it would have been obvious to a person of ordinary skill in the art to use the resonant circuit disclosed by Getgen as the resonant filter disclosed by Larrick

because Getgen's filter design improves quality of the filter (Column 2, lines 5-20).

- 3g. Regarding claim 16, Larrick further discloses the transmitter, wherein said load device comprises an antenna and said switching device comprises a transistor (Column 10, lines 26 – 38). Also, a transistor inherently switches off at or near a zero crossings of current flowing through said transistor (See footnote ¹).

Allowable Subject Matter

4. Claims 12-14, 17, 20 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:
- McCorkle et al. (US 7010056 B1) shows method for generating ultra wideband pulses with a timing generator.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vineeta S. Panwalkar whose telephone number is 571-272-8561. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

VP


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SUPERVISORY PATENT EXAMINER